ZX Platform Condensing Unit
User Manual

Copeland™ brand products

EMERSON™ Climate Technologies

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ZX Platform CDU

Disclaimer

Thank you for purchasing the ZX platform condensing unit from Emerson Climate Technologies. ZX platform CDUs are the best in class within the capacity and operating range available in the market. ZX CDU is designed to operate reliably and to deliver high operating efficiencies in medium and low temperature refrigeration applications. It also provides constant monitoring of the compressor operating conditions and displays the running or fault conditions of the CDU. ZX platform CDUs have to be installed by following the industry trade practices for its safe and reliable operation. It is assumed that the CDU is selected, installed and serviced only by professionals. The user manual does not cover good industry practices which are essential on a refrigeration equipment installation. No responsibility can be accepted for damage caused by inexperienced or inadequately trained site technicians or improper installation design.

If in doubt, please consult your local sales office, quoting unit model and serial number as shown on each unit nameplate. In case of any ambiguity, the wiring diagram supplied with each unit takes precedence over the diagram in this manual.

Introduction to ZX Platform CDU

ZX medium temperature, **ZXD** digital medium temperature and **ZXL** low temperature series have been highly successful in the Asian market and enjoys proven success with its energy savings and customer-friendly electronic features. ZX, ZXD and ZXL CDUs have been applied by several well known end-users and chain retailers throughout Asia. The ZX platform is also gaining wider acceptance in the global market and specific variants have been developed and exported to the USA and to the European and Middle East markets.

Receiving your unit

All units are shipped with a holding charge of dry nitrogen inside at a low but positive pressure. Suitable labeling is prominently displayed on both the unit and the packaging. Service connectors are provided on the CDU service valve for the convenient checking of the integrity of the holding charge.

Caution! It is very important to check that this holding pressure exists at the time you receive each unit from us or our authorized representatives. Please inform us or our authorized representative if the holding charge is non-existent. Failure to do so could void the claim for other related system faults at a later period.

Transit damage is essentially an insurance claim and is not covered under manufacturing defect. It is also advisable to inspect the rest of the unit for obvious physical damage and inform us or our authorized representative in case any is discovered.

ZX Platform Condensing Unit was designed based on three factors demanded by industry users:

Energy Efficiency - Utilizing Copeland Scroll® compressor technology, variable speed fan motor, large capacity condenser coil and advanced control algorithms, energy consumption is significantly reduced. End-users can save more than 20% on annual energy costs rather than using hermetic reciprocating units.

Reliability - Combining the proven reliability of Copeland Scroll® compressors with advanced electronics controller and diagnostics, equipment reliability is greatly enhanced. Fault code alerts and fault code retrieval capabilities provide information to help improve speed and accuracy of system diagnostics. Integrated electronics provide protection against over-current, over-heating, incorrect phase rotation, compressor cycling, high pressure resets, low pressure cut-outs. It can also send out a warning message to an operator when there is a liquid floodback, which can prevent critical damage on the unit.

Flexibility - The slim shape and light weight make the ZX Condensing Unit aesthetically appealing and eases the installation process. The ultra quiet variable-speed fan motor significantly reduces exterior sound levels, allowing additional location flexibility. Combined with wall mounting capability, the ZX Condensing Unit delivers unmatched flexibility.

ZX Condensing Units are greatly suitable for walk-in cooler and freezer applications.

The advance scroll compressor technology, fan speed control and electronic controller are precisely collaborated in all units. It also introduces variable-speed fan motors that go beyond national standards. Guaranteed dependable performance and operation in foodservice applications while conveying higher energy efficiency and lower sound levels are the main objectives.

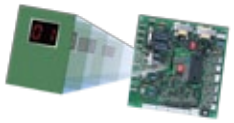
Diagnostic Protection	Increased Reliability and Lower Maintenance Costs
Flexibility	More Installation Options
Highest Efficiency	Lower Energy Bills

ZXD Series

- Shuts down unit during failure
- With real time monitoring of compressor operating conditions

ZX and ZXL Series

Proprietary Electronic Algorithms to Control Fan Speed, Optimizing Energy Performance for Local Seasonal Ambient Temperatures



Diagnostic Digital Messaging

Built-in ZX Platform Controller

- Compressor Reverse Rotation
- Compressor Over Current
- Compressor Internal Motor Protector Trip
- Discharge Gas Over Heat
- High Pressure Cut Out
- Low Pressure Cut Out (only on MT series)
- Refrigerant Flood Back
- Compressor Minimum Off Time
- Internal Thermal Sensor Failure

Variable Speed Fan Motor and High Efficiency Fan Blade

Oversized Condenser Coil for Maximum Heat Transfer

Copeland Scroll Compressor Technology – High Efficiency, Ultra Quiet, High Reliability

Figure 01. ZX Platform CDU Features

Nomenclature

Z	X	L	0	2	0	E	-	T	F	D	-	4	5	1
Unit Family		= Medium Temp L = Low Temp D = Digital Medium Temp		2.0 to 7.6 HP		E = Ester oil O = Mineral Oil		PFJ = 220V/240V- 1ph- 50 Hz	TFD = 380V/420V- 3ph- 50 Hz	TF5 = 200V/230V- 3ph- 60 Hz TF7=380 - 3ph - 60 Hz		Bill of Material		
Base Model								Electrical Code				Bill of Material		

BOM

CDU Family	ZX		ZXL			ZXD		
BOM	401	451	451	461	471	450	451	461
Liquid Line Filter Dryer/Sight Glass	■	■	■	■	■	■	■	■
Oil Separator		■	■	■	■	■	■	■
Accumulator			■	■	■			
Adjustable LP Switch	■	■	■	■	■			
Fixed LP Switch	■	■				■	■	■
E2 Controller	■	■	■	■	■			
Diagnostic Module	■	■	■	■	■			
Buzzer	■	■	■		■			
Digital Scroll Controller						■	■	■
Fan Speed Controller							■	■
Circuit Breaker	■	■	■	■	■	■	■	■
Sound Jacket	■	■	■	■	■	■	■	■
Defrost Module	ACC	ACC	ACC	■	ACC			
Filter Drier	■	■	■	■	V	■	■	■

Notes: - *E2 controller has fan speed control function*
- *"V" indicates flare type connection*
- *"ACC" indicates accessory*

Physical Layout

The following figures give an introduction to the physical layout of the ZX Platform CDU.

Figure 02: Identifies the Electronic controller assembly on a ZX platform CDU.

** ZXD Digital scroll controller not shown in Fig. 02. See Fig. 05 for LED and keypad*

Figure 03: Identifies other major components layout on a ZX platform CDU.

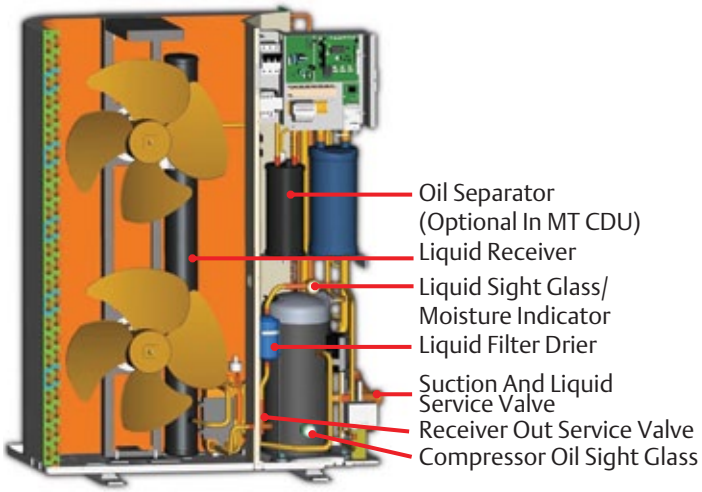


Figure 04: Shows the layout of the E2 controller, electrical components, dip switches and rotary switch in the E2 control board.

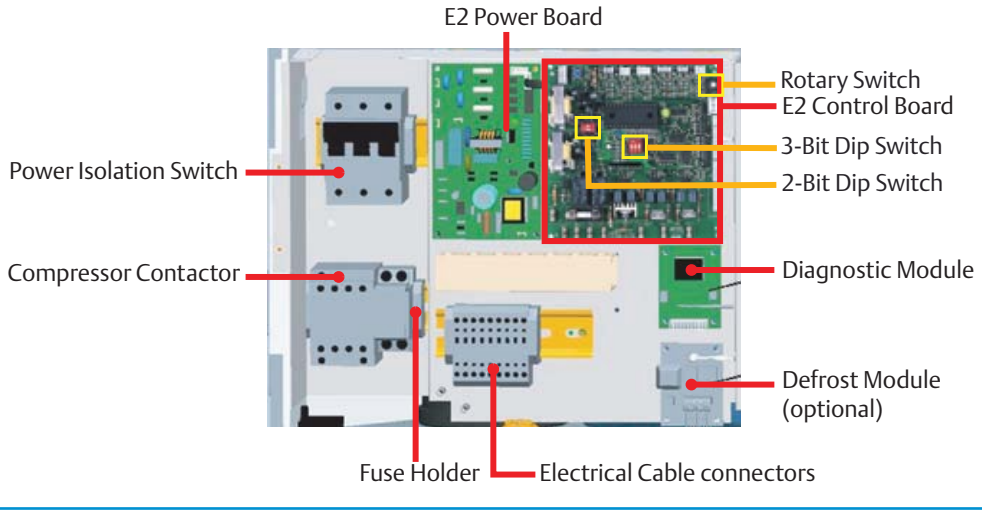
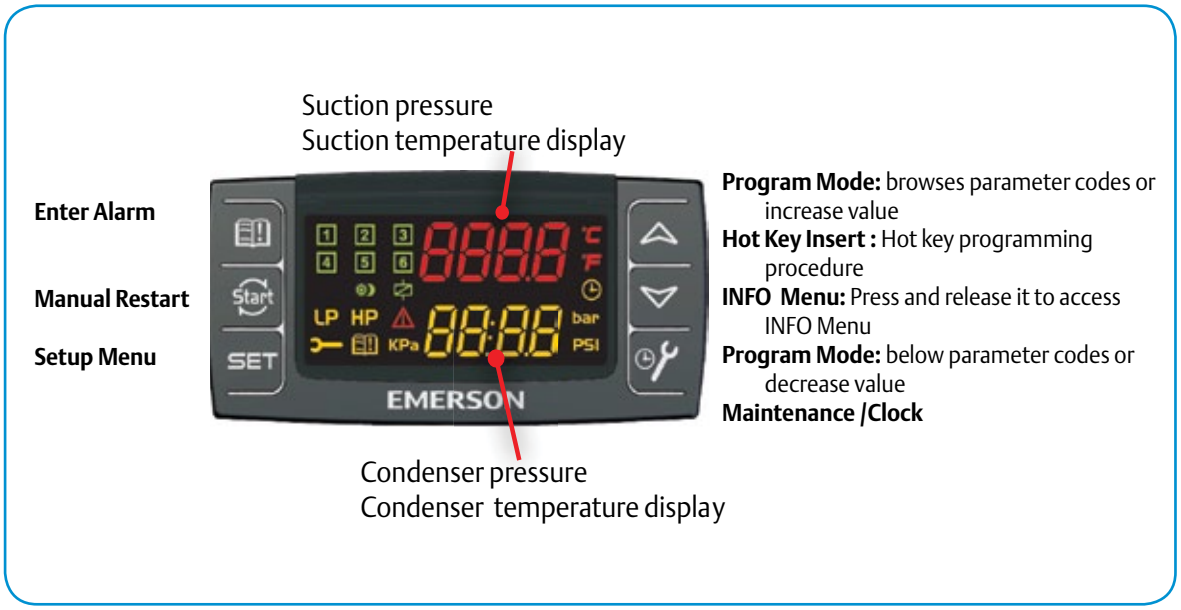


Figure 05: Shows LED and keypad of ZXD digital scroll controller.



Product Specification

For application envelope, envelope varies according to applications and refrigerants. Please refer to ZX platform product catalogue, product manual, or Copeland® Brand Products Selection Software.

Qualified refrigerants and oils

REFRIGERANT	OIL
R404A/507	Emkarate RL 32 3MAF Mobil EAL Artic 22 CC
R22	Suniso 3GS

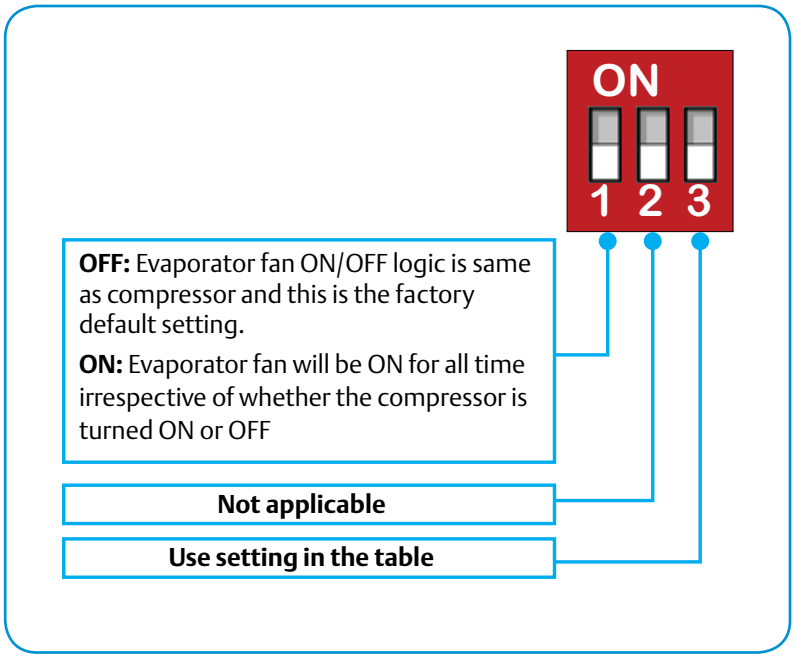
Oils are pre-charged in both compressor and oil separator. Total oil volume (liter) for each unit is shown in the table below:

ZX			ZXD		ZXL	
Model	BOM		Model	BOM	Model	BOM
	401	451		ALL		ALL
ZX0200/E	1.18	1.68			ZXL0200/E	1.06
ZX0250/E	1.33	1.83			ZXL0250/E	1.06
ZX0300/E	1.33	1.83			ZXL0300/E	1.06
					ZXL0350/E	1.74
ZX0400/E	1.83	2.33	ZXD0400/E	1.74	ZXL0400/E	1.74
ZX0500/E	1.83	2.33	ZXD0500/E	2.27	ZXL0500/E	1.74
ZX0600/E	1.66	2.16	ZXD0600/E	2.27	ZXL0600/E	2.27
ZX0750/E	1.66	2.16	ZXD0750/E	2.27	ZXL0750/E	2.27
ZX0760/E	1.66	2.16				

E2 Control Board - Rotary Switch And Dip Switch Setting (ZX-MT & ZXL-LT)

Model	Rotary Switch	3-Bit No. 3	2-Bit 1/2
ZX0200/E-PFJ	7	OFF	ON/ON
ZX0250/E-PFJ	8	OFF	ON/ON
ZX0300/E-PFJ	9	OFF	ON/ON
ZX0400/E-PFJ	A	OFF	OFF/OFF
ZX0200/E-TFD	1	OFF	ON/ON
ZX0300/E-TFD	2	OFF	ON/ON
ZX0400/E-TFD	3	OFF	ON/ON
ZX0500/E-TFD	4	OFF	ON/ON
ZX0600/E-TFD	5	OFF	ON/ON
ZX0750/E- 760/E-TFD	6	OFF	ON/ON
ZX0200/E-TF5	1	ON	ON/ON
ZX0300/E-TF5	2	ON	ON/ON
ZX0400/E-TF5	3	ON	ON/ON
ZX0500/E-TF5	4	ON	OFF/OFF
ZX0600/E-TF5	5	ON	OFF/OFF
ZX0750/E- 760/E-TF5	6	ON	OFF/OFF
ZX0200/E-TF7	7	ON	ON/ON
ZX0300/E-TF7	8	ON	ON/ON
ZX0400/E-TF7	9	ON	ON/ON
ZX0500/E-TF7	A	ON	ON/ON
ZX0600/E-TF7	A	ON	ON/ON
ZX0750/E- 760/E-TF7	B	ON	ON/ON
ZXL0200/E-TFD	1	OFF	ON/ON

Model	Rotary Switch	3-Bit No. 3	2-Bit 1/2
ZXL0250/E-TFD	2	OFF	ON/ON
ZXL0300/E-TFD	3	OFF	ON/ON
ZXL0350/E-TFD	4	OFF	ON/ON
ZXL0400/E-TFD	5	OFF	ON/ON
ZXL0500/E-TFD	6	OFF	ON/ON
ZXL0600/E-TFD	7	OFF	ON/ON
ZXL0750/E-TFD	8	OFF	ON/ON
ZXL0200/E-TF5	1	ON	ON/ON
ZXL0250/E-TF5	1	ON	ON/ON
ZXL0300/E-TF5	2	ON	ON/ON
ZXL0350/E-TF5	3	ON	OFF/OFF
ZXL0400/E-TF5	4	ON	OFF/OFF
ZXL0500/E-TF5	5	ON	OFF/OFF
ZXL0600/E-TF5	6	ON	OFF/OFF
ZXL0750/E-TF5	7	ON	OFF/OFF
ZXL0200/E-TF7	8	ON	ON/ON
ZXL0250/E-TF7	8	ON	ON/ON
ZXL0300/E-TF7	9	ON	ON/ON
ZXL0350/E-TF7	A	ON	ON/ON
ZXL0400/E-TF7	B	ON	ON/ON
ZXL0500/E-TF7	C	ON	ON/ON
ZXL0600/E-TF7	D	ON	ON/ON
ZXL0750/E-TF7	D	ON	ON/ON


ON
1 2 3
OFF: Evaporator fan ON/OFF logic is same as compressor and this is the factory default setting.
ON: Evaporator fan will be ON for all time irrespective of whether the compressor is turned ON or OFF
Not applicable
Use setting in the table

Notes: The settings given in the table are pre-set at the factory for new units.

Defrost Module Function Set

Time of Defrost		Time of Defrost Interval	
Rotary Switch1	Time(min)	Rotary Switch2	Time (hours)
0	0	0	0
1	5	1	1
2	10	2	2
3	15	3	3
4	20	4	4
5	25	5	5
6	30	6	6
7	35	7	7

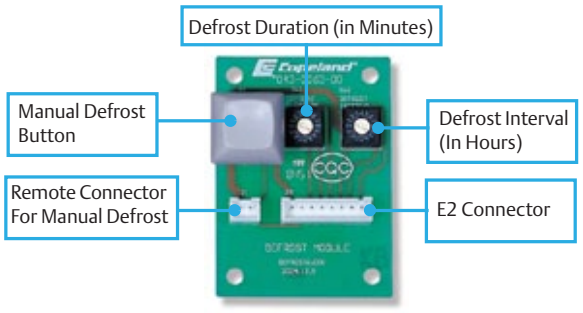


Figure 06: ZX Platform Defrost Module

Digital Scroll controller (ZXD)

The controller has been pre-programmed with a number of parameter values that are **set for typical application**. Individual installation requirements, however, may make it necessary to alter parameter settings. The control target of the digital scroll compressor controller is to maintain the suction pressure (or saturated suction temperature) at a defined value by varying the available compressor capacity. **The set-point can be altered using the SEtC parameter**. Factory setting SEtC is -6°C.

The control target of the fan speed controller is to maintain the average condenser mid-coil temperature and hence the average discharge pressure at a defined value. This is achieved by varying the fan speed. The set-point can be altered using the SEtF parameter. Factory setting SEtF is 25°C.Initial setting of set point for saturated suction temperature.Pre-set value is located in the SEtC position as shown in the diagram below:

SET press for more than 2 sec

or to change set value within 30 seconds

SET press to memorize new set value.

Then SEtF (fan speed control set point) will be displayed automatically.

or to change set value within 30 seconds

SET press to memorize new value and Exit, or wait for

30 seconds without pressing any key to memorize value and exit

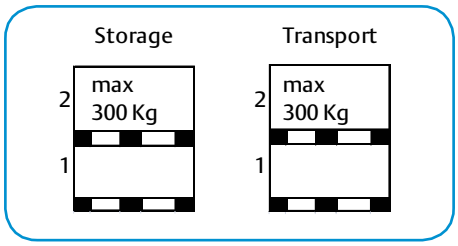
Installation

Copeland ZX condensing units are delivered with a holding charge of neutral gas. The condensing unit should be located in such a place to prevent any dirt, plastic bag, leaves or papers from covering the condenser and its fins. The unit must be installed without restricting the airflow. A clogged condenser will increase the condensing temperature, thus reduce the cooling capacity, and lead to a high-pressure switch tripping. Clean the condenser fins on a regular basis.

Condensing Unit Handling

Transport And Storage

Move ZX/ZXD/ZXL unit only with appropriate mechanical or handling equipment according to weight. Keep in the upright position. **Do not stack single boxes on top of each other without pallet in any case**. Keep the packaging dry at all times.



Net Weight

ZX		ZXD		ZXL	
Model	**Weight (kg)**	**Model**	**Weight (kg)**	**Model**	**Weight (kg)**
ZX0200/E	76	ZXD0400/E[2]	104	ZXL0200/E	79
ZX0250/E	79	ZXD0500/E[3]	112	ZXL0250/E	81
ZX0300/E	79	ZXD0600/E[4]	114	ZXL0300/E	81
ZX0400/E[1]	91	ZXD0750/E[5]	122	ZXL0350/E	93
ZX0500/E	108			ZXL0400/E	93
ZX0600/E	112			ZXL0500/E	106
ZX0750/E	118			ZXL0600/E	116
ZX0760/E	121			ZXL0750/E	121

Notes:
[1] 100 kg for models under 60 Hz TF5/7 and 50 Hz PFJ
[2] 109 kg for models under 60 Hz TF7
[3] 117 kg for models under 60 Hz TF7
[4] 121 kg for models under 60 Hz TF7
[5] 127 kg for models under 60 Hz TF7

Electrical Connection

Power supply

The ZX condensing unit electrical connection to the power supply must be made by qualified technicians, who should refer to the electrical diagrams located inside the electric connection panel. The units are designed for below power supply at ± 10% voltage tolerance. The circuit breaker must be switched off before opening the front panel.

Codes	HZ	Phase	Voltages
PFJ	50	1	220/240
TFD	50	3	380/420
TF7	60	3	380
TF5	60	3	200/230

Electrical wiring

Before commissioning, ensure that neutral “N” wire is connected to the terminal block (“N” furthest to the right). After proper connection of the ZX condensing unit, the control LED on the power board and control board will light. For more details, see wiring diagram in Appendix.

Refrigeration connections

Refrigeration piping installation

All interconnecting pipes should be of refrigeration grade, clean, dehydrated and must remain capped at both ends until installation. Even during installation, if the system is left for any reasonable period of time (say two hours), pipes should be re-capped to prevent moisture and contaminants from entering the system.
Do not assume that the service connection sizes on the unit (at the service valves) are the correct size to run your interconnecting refrigeration pipes. The service valve sizes have been selected for convenience of installation and in some cases (larger units) these may be considered too small. However for the very short pipe run within our units, these service connection sizes are adequate. All interconnecting pipes should be sized to satisfy the duty required.

Usually the suction line is insulated, but the liquid line is not. However the liquid line can pick up additional heat from the ambient and adversely affect the sub-cooling desirable for the liquid refrigerant before it enters the expansion valve.

The pipe should be sized to ensure optimum performance and good oil return. The sizing must also take into account the full capacity range through which this particular unit will need to operate.

Pipe runs should be kept as short as possible, using the minimum number of directional changes. Use large radius bends and avoid trapping of oil and refrigerant. This is particularly important for the suction line. The suction line should ideally slope gently towards the unit. Recommendation slope is 1/200~1/250. P traps, double risers and reduced pipe diameters may be required for suction lines where long vertical risers cannot be avoided. All pipes should be adequately supported to prevent sagging which can create oil traps. The recommended pipe clamp support distance is shown in the table.

Tube Size	Max distance between 2 clamp support
12.7mm (1/2 inch)	1.20 m
16.0mm (5/8 inch)	1.50 m
22.0mm (7/8 inch)	1.85 m
28.5mm (1 1/8 inch)	2.20 m

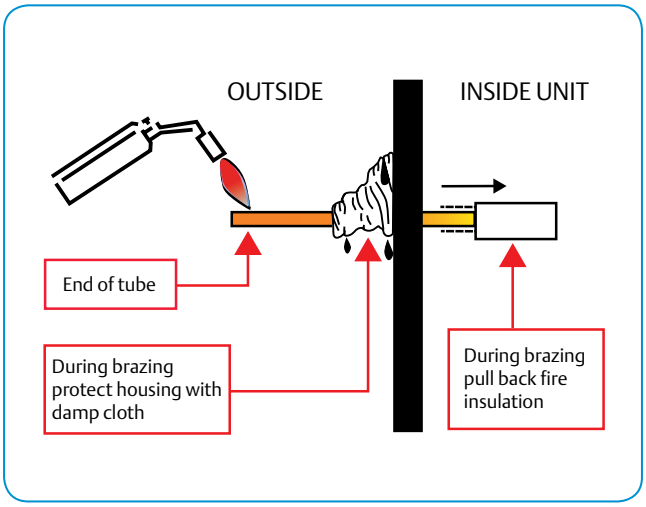
ZXL liquid line insulation

ZXL liquid line should be insulated with a 19 mm insulation thickness. Temperature could be as low as –15°C.

Brazing recommendations

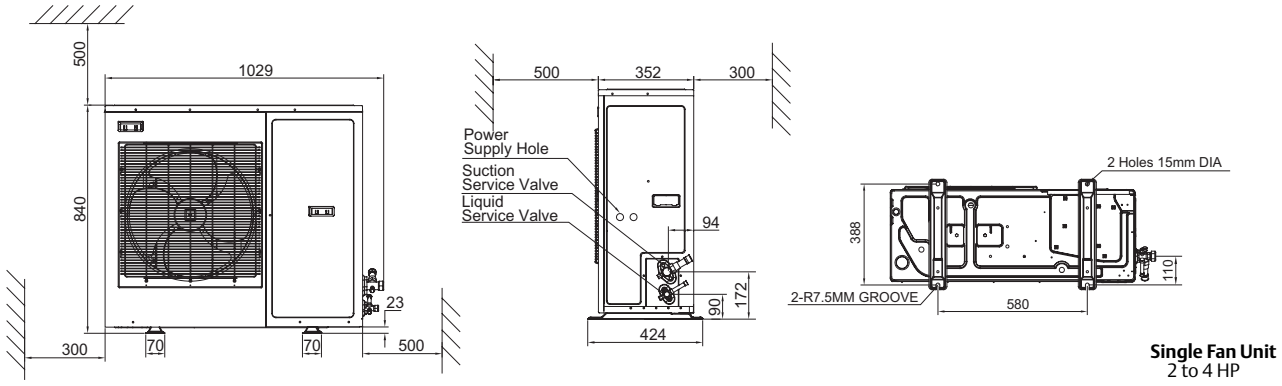
Maintain a flow of oxygen-free nitrogen through the system at a very low pressure during brazing. Nitrogen displaces the air and prevents the formation of copper oxides in the system. If copper oxidization is allowed to form, the copper oxide material can later be swept through the system and block screens such as those protecting capillary tubes, thermal expansion valves, and accumulator oil return holes. This minimizes any entry of contaminants and moisture.

- Remove the liquid line connection cap.
- Then remove the suction connection cap.
- Open both valves midway. Care should be taken to avoid the holding charge from releasing too quickly.
- Be sure tube fitting inner diameter and tube outer diameter are clean prior to assembly.
- Since both tubes are extended from the condensing unit housing, we recommend insulating the housing by using a wet cloth on the copper tubing.
- Recommended brazing materials: a copper / phosphorous or copper / phosphorous / silver alloy rod should be used for joining copper to copper whereas to join dissimilar or ferric metals, use a silver alloy rod, either flux coated or with a separate.
- Use a double tip torch.

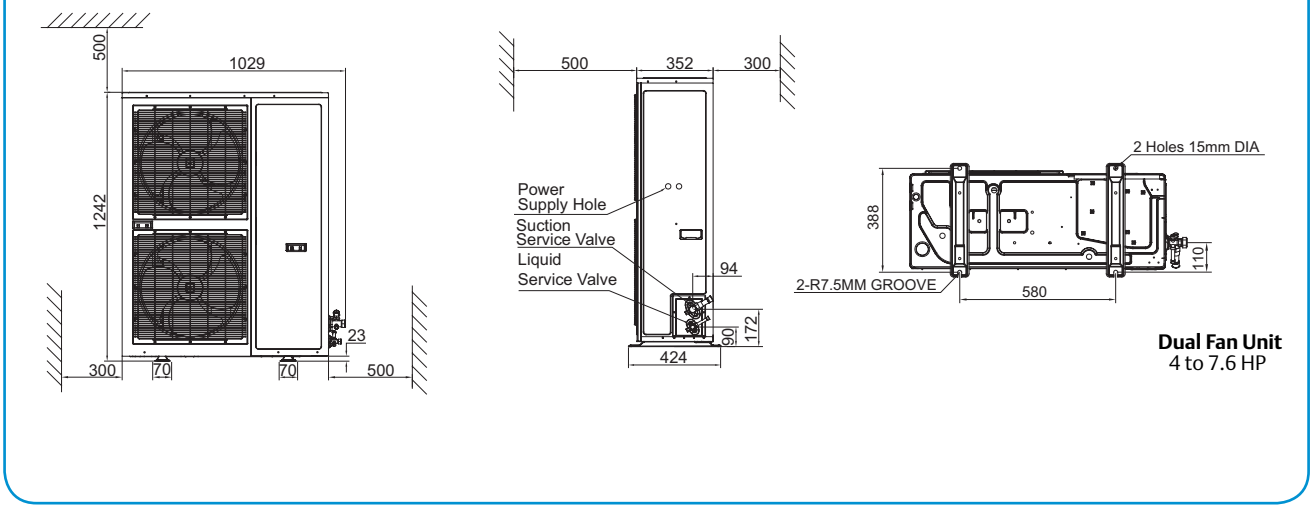


Location and fixing

The unit should always be installed in a location that ensures clean air flow. It is recommended that a clearance of 300 mm from the wall (or the next unit) be maintained from the unit's left and rear panels whereas a clearance of 500 mm must be maintained from the unit's right, top and front panels (seen facing the front of the unit). Both service access and airflow have been considered in making these recommendations. Where multiple units are to be installed in the same location, the contractor needs to consider each individual case carefully. There can be many variations of unit quantities and available space and it is not the intention of this manual to go over these. Ideally, the unit should be mounted on a solid concrete slab with anti-vibration pads between unit feet and concrete. However the ZX condensing unit has also been designed for wall mounting on suitable brackets. Wall mounting brackets are not included. Another factor to consider in finding a good installation site is the direction of the prevailing wind. For example if the air leaving the condenser faces the prevailing wind, the air flow through the condenser can be impeded, causing high condensing temperatures ultimately resulting in reducing unit life. A baffle is a remedy for this situation.



Fixing dimensions and distances - Single fan unit



Fixing dimensions and distances - Dual fan unit

Start Up and Operation

Before commissioning, ensure that all valves on the condensing unit are fully opened.

Evacuation

The evacuation procedure is based upon achieving an actual system vacuum standard and is not time dependent. Before the installation is put into commission, it has to be evacuated with a vacuum pump. Proper evacuation reduces residual moisture to 50ppm. The installation of adequately sized access valves at the furthest point from the compressor in the suction and liquid lines is advisable. To achieve undisturbed operation, the compressor valves are closed and the system is evacuated down to 0.3 mbar / 0.225 Torr. Pressure must be measured using a vacuum pressure (Torr) gauge on the access valves and not on the vacuum pump; this serves to avoid incorrect measurements resulting from the pressure gradient along the connecting lines to the pump.

Charging procedure

Refrigerant charging procedure

The scroll compressor design requires system charging as quickly as possible with liquid refrigerant into the liquid line. This will avoid running the compressor under conditions where there is insufficient suction gas. Sufficient suction gas is available to cool not only the motor but also the scrolls. Temperature builds up very quickly in the scrolls if this is not done. Do not charge vapor (gas) refrigerant into the ZX Scroll unit. The suction service valve must not be fully closed at any time while the compressor is running. To do so would cause damage to the compressor in the same manner as explained above. This valve is provided for ease of connection and for the fitting of service gauges without removing the unit panel. It is recommended to charge the ZX unit with refrigerant via its service valves. It is recommended to break the vacuum in the system with a partial charge of the refrigerant, before starting the system. For charge adjustment, it is recommended to check the liquid sight glass just before the expansion valve.

Oil charging procedure

Emerson ZX condensing units are supplied only with a compressor oil charge. After commissioning, the oil level should be checked and topped up if necessary. The oil level should be approximately halfway up the sight glass (ZXL/ZXD units). Oil can be charged through the Schraeder valve on suction valve.

Scroll compressor rotation direction

Scroll compressors, like several other types of compressors, will only compress in one rotational direction. The direction of rotation is not an issue with single-phase compressors since they will always start and run in the proper direction. Three-phase compressors will rotate in either direction depending upon the phasing of the power. Since there is a 50-50 chance of connecting power in such a way that causes rotation in the reverse direction, it is important to include notices and instructions in appropriate locations on the equipment to ensure proper rotation direction when the system is installed and operated.

Maximum compressor cycle

Maximum permitted starts per hour is 10.

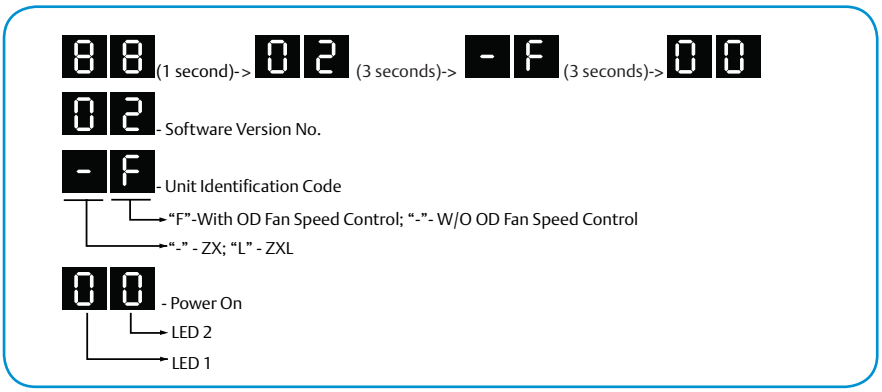
Check before starting & during operation

Both valves should be fully opened on the liquid line, in order to prevent trapping liquid.

- Check that all valves are fully opened.
- After starting and operation conditions are stabilized, it is recommended to check the oil level in compressor(s) and see if there is a need to add oil to ensure a sufficient oil level (halfway up the sight glass).

Diagnostic Initialization Message (ZX-MT and ZXL-LT)

When the unit is initially powered on, the diagnostic module will show the following signals.


88 (1 second)-> 02 (3 seconds)-> -F (3 seconds)-> 00
02
- Software Version No.
-F
- Unit Identification Code
"F"-With OD Fan Speed Control; "-"- W/O OD Fan Speed Control
"-" - ZX; "L" - ZXL
00
- Power On
LED 2
LED 1

Diagnostic messaging - LED definition (ZX-MT and ZXL-LT)

LED1-Unit Status		LED2-Error/Warning Code		Display Warning Signal	Controller Pause Unit Automatic Reset	Controller Lock Unit Manual Reset
Display	Status	Dis-play	Error/Warning			
0	Idle (Stop When Reach To Set-point)	0	No error/warning			
1	Run	1	Compressor Phase Error (Wrong Phase Sequence/Loss of Phase)	Every Protection Action	Every Protec-tion Action	NA
2	About To Start ①	2	Compressor Inside Thermal Protector Trip	Every Protection Action	NA	NA
3	Defrost	3	Compressor Over Current	Every Protection Action	<5 times Protection In 1 Hour	6th Protection In 1 Hour
4	Stop Due to Error	4	Overheat	Every Protection Action	ZX: <5 times Protection In 1 Hour ZXL: Every Protection	ZX: <6th Protection In 1 Hour ZXL: NA
5	Lockout	5	Compressor High Pressure Cut Out	Every Protection Action	<5 times Protection In 1 Hour	6th Protection In 1 Hour
		6	Compressor Low Pressure Cut Out ②	Every Protection Action	Every Protection	NA
		7	DLT Thermistors Failure	Every Protection Action	<5 times Protection In 1 Hour	NA
		8	Ambient Temperature Sensor Failure	Every Protection Action	NA	NA
		9	Mid-coil Temperature Sensor Failure	Every Protection Action	NA	NA
		A	PHE Vapor In Temperature Sensor Failure or Over Range ③	Every Protection Action	NA	NA
		C	PHE Vapor Out Temperature Sensor Failure or Over Range ③	Every Protection Action	NA	NA
		E	System Liquid Flood Back Warning	~20% Liquid Back	NA	NA

Notes:

① *New start, normal start by program and any start request delay*

② *"LP Cutout" signal is not applicable in ZXL condensing unit.*

③ *PHE Vapor In/Out temperature sensor is not applicable in ZX medium temperature condensing unit.*

Alarm messaging - Digital scroll controller (ZXD)

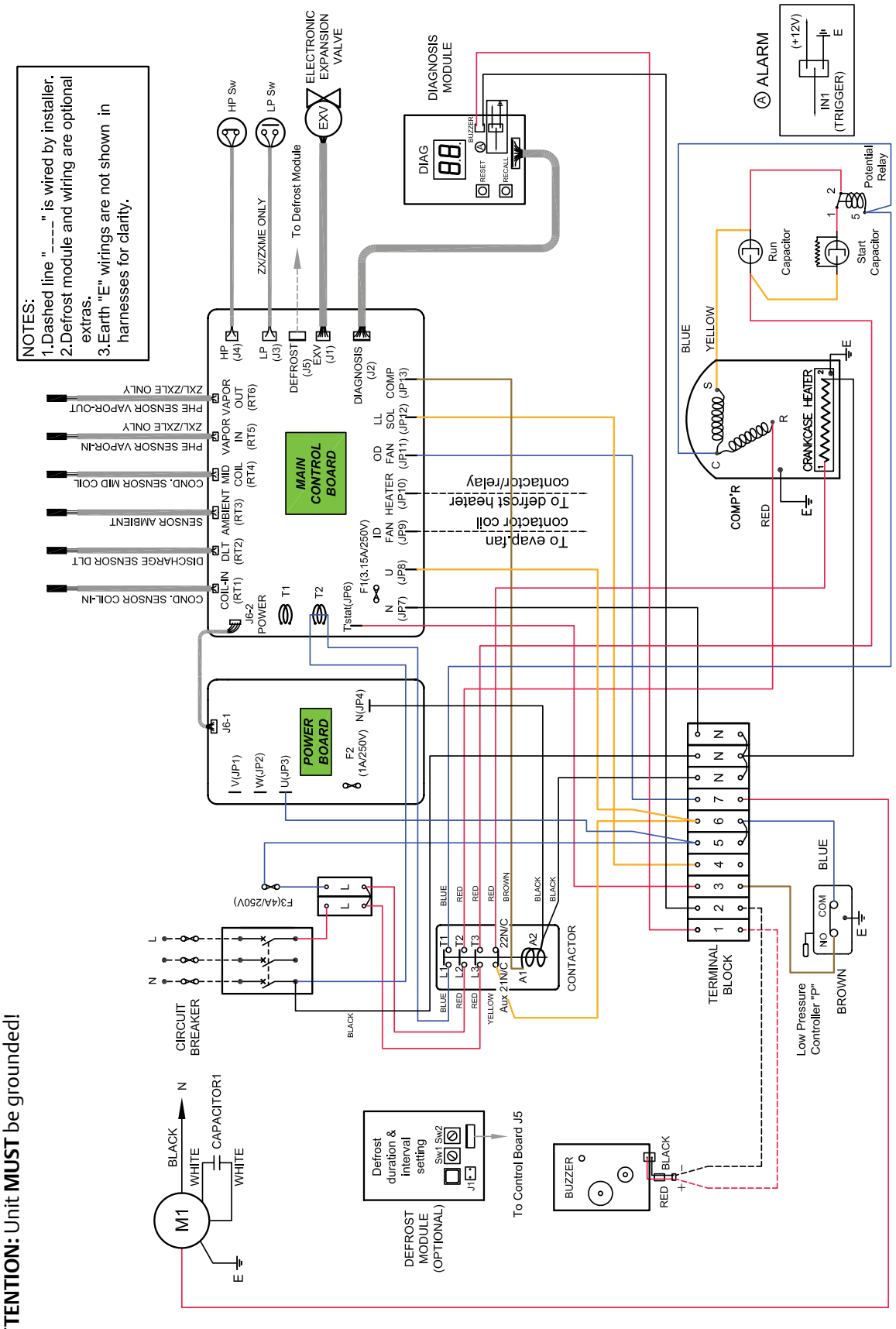
Alarm Mode	Set Points	Controller Actions	Reset	Remarks
dtL	DLT >= dtL after dLd time delay	- Compressors are turned off	Auto reset when DLT < dtL-dLH	DLT
E01L	Low pressure is lower than ELP (Level 3 Parameter)	- Compressors are turned off - Fans are unchanged	Auto reset when LP >= ELP(Level 3)	LP
E0L	Mechanical LP switch opens	- Compressors are turned off - Fans are unchanged	Auto reset when Number of activations < PEn in PEi time	LP
			Manual reset when Number of activations >= PEn in PEi time - Press key for 3 sec or - Turn off and on the unit	LP
C-LA	LP < LAL	- Signaling only	Auto reset when LP = LAL + delta (0.3bar)	LP
C-HA	LP >= HAL	- Signaling only	Auto reset when LP = HAL -delta (0.3bar)	LP
E0H	Condensing Temperature High	- Compressors are turned off - Fans are turned on	Auto reset when Number of activations < PEn in PEi time	Cond Mid Temp.
			Manual reset when Number of activations >= PEn in PEi time - Press key for 3 sec or - Turn off and on the unit	Cond Mid
F-HA	HP >= HAF	- HFC = yes, compressor are turned off	Auto reset when HAF + delta (0.3bar)	Cond Mid Temp.
P1	Suction Transducer failure or out of range	- Compressors are activated according to SPr or PoPr	Auto reset when probe is normal	LP
P2	Condenser Mid Coil Sensor failure or out of range	- Fans are activated according to FPr	Auto reset when probe is normal	Cond Mid Temp.
P3	Discharge Temp Sensor failure or out of range	-The functions related to No.3 probe are disabled	Auto reset when probe is normal	DLT

DLT: Discharge line temperature
LP: Low pressure
HP: High pressure

ZX Condensing Unit Wiring Diagram

PFJ: 220V-50 Hz -1Ph

ATTENTION: Unit **MUST** be grounded!

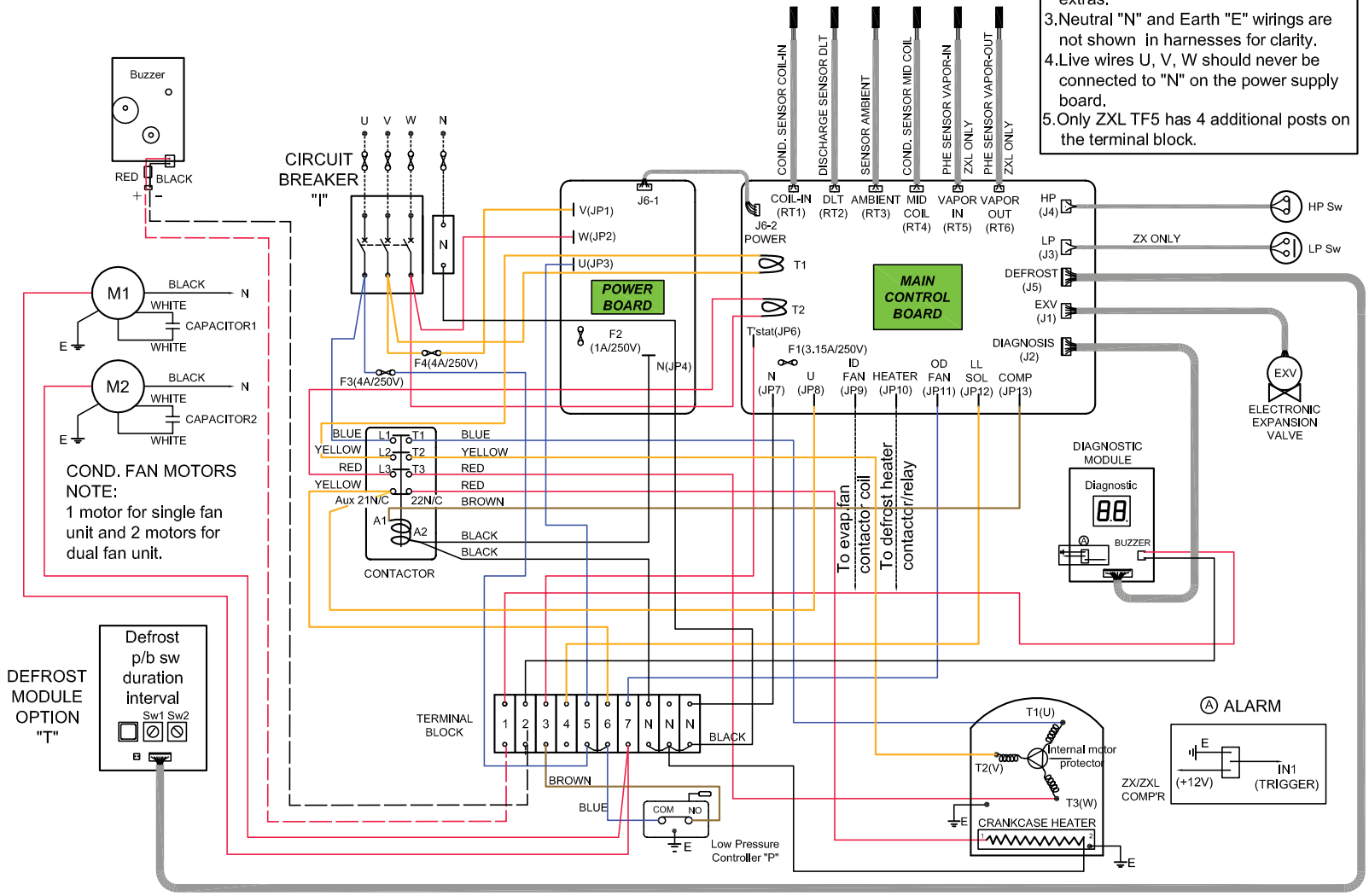


ZX/ZXL Condensing Unit Wiring Diagram

TFD: 380V/420V -50 Hz-3Ph
TF7: 380V-60 Hz -3Ph

ATTENTION: Unit **MUST** be grounded!

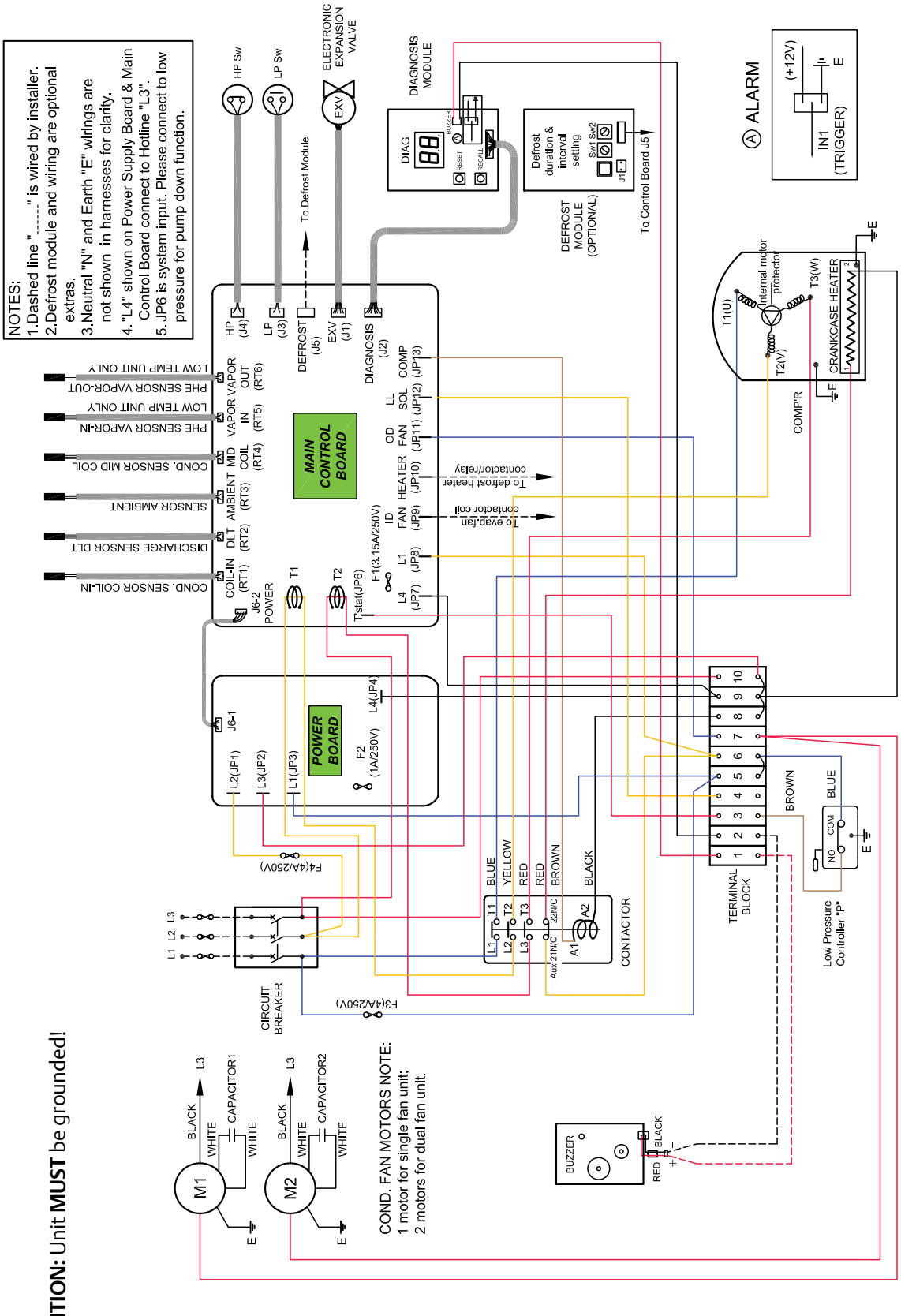
NOTES:
1. Dashed line "_____" is wired by installer.
2. Defrost module and wiring are optional extras.
3. Neutral "N" and Earth "E" wirings are not shown in harnesses for clarity.
4. Live wires U, V, W should never be connected to "N" on the power supply board.
5. Only ZXL TF5 has 4 additional posts on the terminal block.



ZX/ZXL Condensing Unit Wiring Diagram

TF5: 200/230V- 50 Hz/ 60 Hz - 3Ph

ATTENTION: Unit **MUST** be grounded!



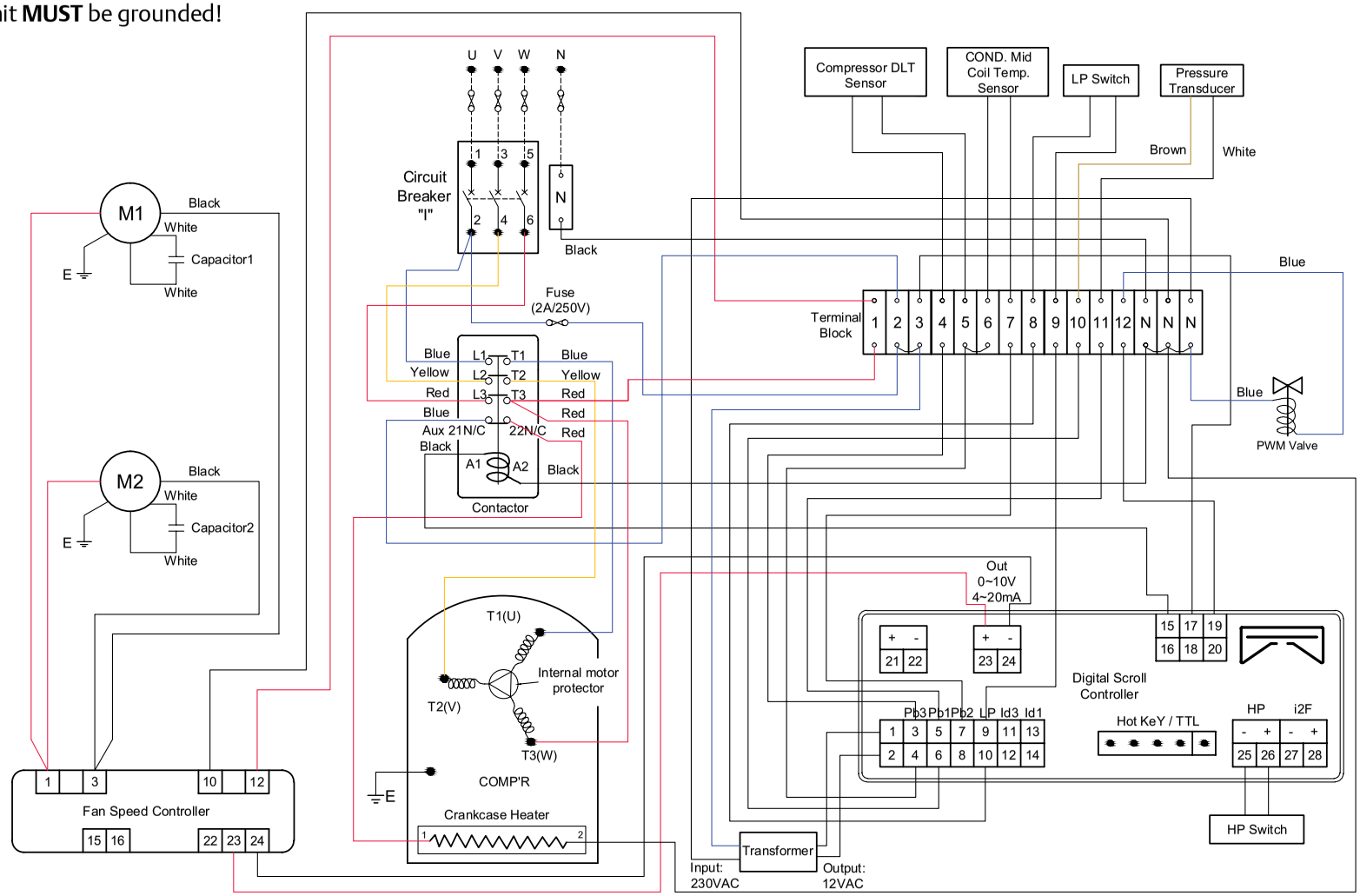
ZXD Condensing Unit Wiring Diagram

(With Fan Speed Control Function)

TFD: 380V/420V -50 Hz-3Ph
TF7: 380V-60 Hz-3Ph

ATTENTION: Unit **MUST** be grounded!

NOTES:
1.Dashed line "____" is wired by installer.



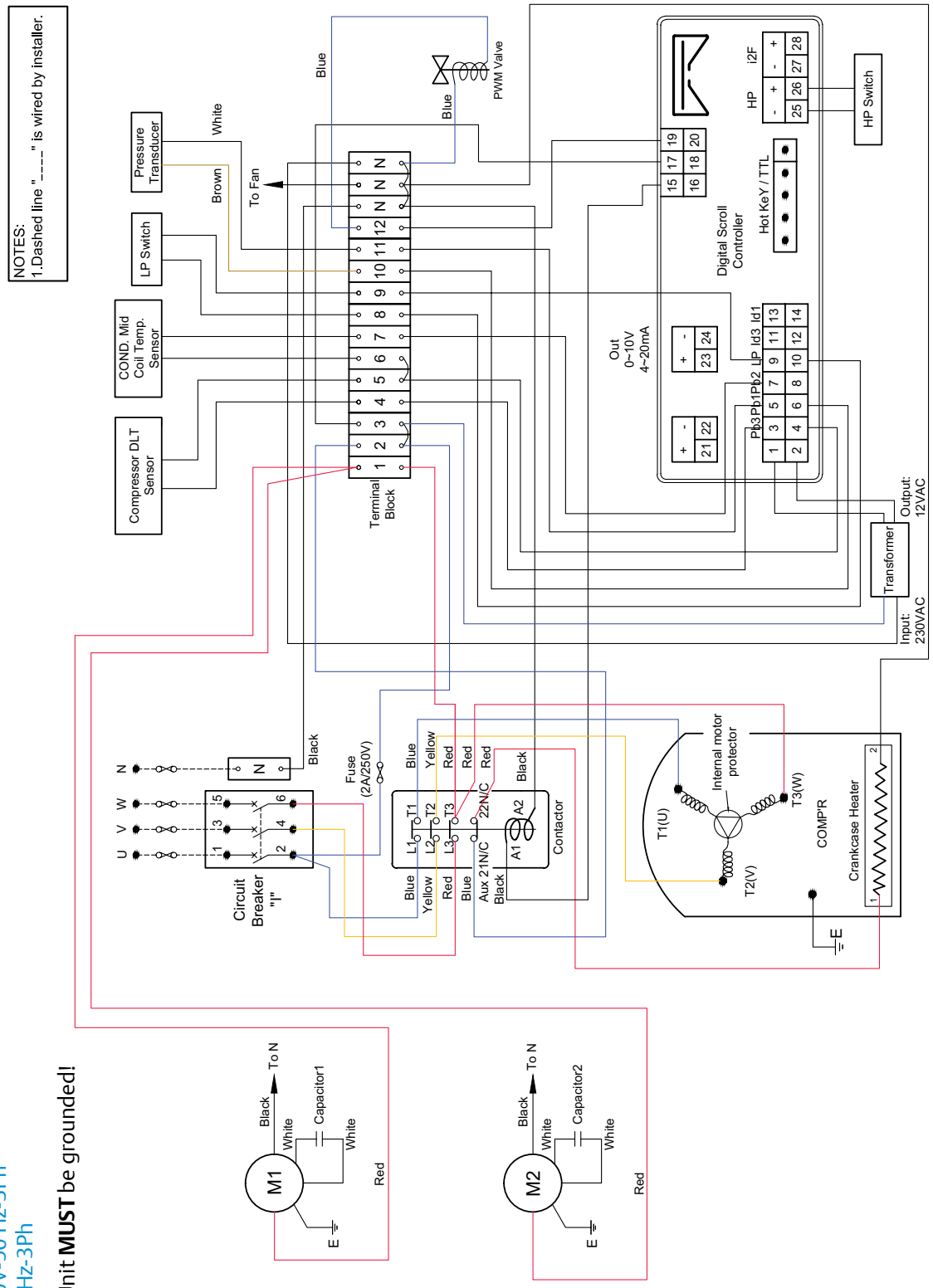
ZXD Condensing Unit Wiring Diagram

(without Fan Speed Control Function)

TFD: 380V/420V-50 Hz-3Ph

TF7: 380V- 60 Hz-3Ph

ATTENTION: Unit **MUST** be grounded!



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